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Indian Standard

PACKAGING CODE

PART 2 PACKAGING MATERIALS

Section 4 Fabrics

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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PACKAGING CODE

PART 2 PACKAGING MATERIALS

Section 4 Fabrics

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PACKAGING CODE

PART 2 PACKAGING MATERIALS

Section 4 Fabrics

0. FOREWORD

0.1 This Indian Standard (Part 2/Sec 4) was adopted by the Indian Standards Institution on 16 October 1986, after the draft finalized by the Packaging Code Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 The packaging code is being issued in the following parts, each having one or more sections:

Part 1	Product packaging
Part 2	Packaging materials
Part 3	Ancillary materials
Part 4	Packages
Part 5	Packaging operations
Part 6	Storage and transportation
Part 7	Packaging machinery

0.2.1 This section (Part 2/Sec 4) of the packaging code deals with fabric/textile materials used for packaging. Packages are described in Part 4, Section 6 of the code.

0.3 Although a variety of fabric/textile materials are available only a few are being used for packaging purposes. Jute fabric being the most important is abundantly available and widely used. This is a hard wearing fabric and is ideal for use as packaging material. Various types of jute materials are described in the code. The other materials being used for packaging and described in this code are cotton and man-made fabric, namely, high density polyethylene (HDPE) fabric.

0.4 In the preparation of this section of the code assistance has been derived from the following publications:

i) BS : 1133, Section 9-1967 Packaging code, textile bags, sacks and wrappings, published by the British Standards Institution (BSI).

ii) Defence Services packaging code, issued by Ministry of Defence, Government of India.

1. SCOPE

1.1 This standard (Part 2/Sec 4) gives details and lays down guidelines for the selection of various types of textile/fabric materials used for packaging.

2. JUTE

2.1 General — Jute is the basic material used for packaging purposes. It is woven on flat or circular looms from natural fibre with the basic qualities of strength and rigidity combined with low extensibility; these properties ensure that the shape and size of the final packages or containers are maintained under a sustained load. Other recognized properties of jute material are its high tear resistance, its substantial breaking load characteristics and its durability which enables it to be re-used many times with consequent savings in packaging cost.

2.2 Terminology — The definitions and terminology relating to jute and jute products are given in IS : 5476-1969*.

2.3 Selection — Jute materials used for packaging are of many descriptions and of a great number of different structures. These range from a light mesh weave to the heaviest and closest of weaves.

2.3.1 For the packer, the choice of material depends on many factors including:

a) nature of contents to be packed;
b) conditions of storage;
c) means of handling and transportation; and
d) impermeability of any secondary packaging material.

2.3.2 Jute will perform its functions for most purposes without any finishing treatment other than the various types of mechanical finishes. Where there is a risk of percolation of fine powders or for the transport of moisture-sensitive materials, composite constructions of jute and papers and plastics films are recommended. These may be in big or sheet form.

2.4 Characteristics

2.4.1 The following characteristics are considered important in jute cloth:

a) width and length of piece required;
b) mass per m^2;
c) type of weave (for example hessian, tarpauling, bagging or sacking);

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*Glossary of terms relating to jute.

d) ends per dm;
e) picks per dm;
f) breaking load of fabric;
g) moisture regain (*see* **2.4.1.1**); and
h) oil content.

2.4.1.1 *Moisture regain* — This is the mass of moisture present in jute or jute goods expressed as a percent of the oven-dry mass.

Example : If 100 parts be mass of material contains 20 parts by mass of moisture, the regain is

$$\frac{100 \times 20}{80} = 25 \text{ percent}$$

2.5 Materials

2.5.0 Jute cloths used for the making of bags, sacks and wrappings are described below.

2.5.1 *Hessians* — Hessians are light, single-warp, plain woven, cloths made from superior mixings of jute, manufactured in varying weights and widths and weighing from 150 to 500 g/m². Details of hessians are given in IS : 2818 (Parts 1 to 6)*.

2.5.2 *Twilled Sackings* — These are double-warp medium to heavy weight fabrics, having a diagonal line in the weave running from selvedge to selvedge. These are used for making bags for different purposes depending upon the closeness of weave. Twilled sackings are of the following types:

i) A-twill cloth (for details *see* IS : 1943-1964†)
ii) B-twill cloth (for details *see* IS : 3667-1966‡)
iii) L-twill (liverpool twill) cloth (for details *see* IS : 3668-1966§)
iv) Jute corn sack cloth (for details *see* IS : 3750-1966||)
v) New jute woolpack (for details *see* IS : 4856-1968¶)

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*Specification for Indian hessian:
(Part 1)-1971 General (*first revision*).
(Part 2)-1971 305 and 229 g/m² at 16 percent contract regain (*first revision*).
(Part 3)-1971 213 and 270 g/m² at 16 percent contract regain.
(Part 4)-1971 213 and 270 g/m² at 14 percent contract regain.
(Part 5)-1974 298 g/m² at 16 percent contract regain.
(Part 6)-1977 245 g/m² at 16 percent contract regain.

†Specification for A-twill jute bags (*revised*).

‡Specification for B-twill cloth.

§Specification for liverpool twill (L-twill) cloth.

||Specification for jute corn sack cloth.

¶Specification for new jute woolpack.

2.5.3 *Double-Warp (DW) Tarpaulin* — Tarpaulin is a double-warp, single weft cloth in plain weave of finer construction than bagging, but coarser than canvas [for details *see* IS : 7407 (Parts 1 to 3)-1980*]. For making DW-tarpaulin jute bags for packing (mint) coins, tarpaulin of uniform construction and of weight 550 g per square metre is used (*see* IS : 3344-1965†).

2.5.4 *Double-Warp Sacking* — This is a double warp heavy jute cloth usually in plain weave, and coarser than tarpaulin. The following cloths are covered under this category:

i) Heavy cee cloth (for details *see* IS : 3751-1966‡)

ii) DW-flour jute cloth (for details *see* IS : 3966-1967§)

2.5.5 *Laminated Jute Fabrics* — These are jute fabrics laminated or reinforced with paper, polyethylene, polyvinyl chloride, etc. Examples of such fabrics are laminated bags manufactured from tarpaulin fabric [for details *see* IS : 7406 (Part 1)-1974||, IS : 7406 (Part 2)-1980|| and IS : 8117-1976¶].

2.6 Proofing — There are various treatments available for water proofing, rot proofing and for increasing the resistance of jute materials to fire.

2.7 Packing — Jute fabrics are packed in bales (For details *see* IS : 2873-1969**).

2.8 Storage — Jute cloth is stored under cover in a well ventilated building, where the materials and construction of the building do not allow excessive atmospheric moisture condensation and rapid temperature changes. The cloth is stacked on solid wooden racks or raised above floor level on not less than 10 cm of dry dunnage. Adequate space should be allowed between the stacks and the walls for ventilation and, where possible, passage should be provided between these stacks. It is also essential that cloth should be reasonably dry before stacking and the stacks should not be allowed to become damp.

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*Specification for jute tarpaulin fabric (*first revision*).

†Specification for DW tarpaulin jute bags for packing (mint) coins.

‡Specification for heavy cee cloth.

§Specification for DW-flour jute cloth.

||Specification for jute bags for packing fertilizers:
(Part 1)-1974 Laminated bags manufactured from 407 g/m^2; 85 × 39 tarpaulin fabric.
(Part 2)-1980 Laminated bags manufactured from 380 g/m^2; 68 × 39 tarpaulin fabric.

¶Specification for DW tarpaulin laminated jute bags for pesticides.

**Specification for packaging of jute products in bales.

3. COTTON

3.1 General — Cotton fabric is not as widely used as jute fabric for making bags. The fabric is, however, durable and economical as it can be reused for other purposes. Cotton fabric accepts branding or printing readily and very small designs can be reproduced clearly on this fabric. Cotton cloth used for making bags avoids any percolation while permitting aeration. The types of bags made of cotton fabric and their uses are given in (Part 4/Sec 6) of the code.

3.2 Materials — Cotton fabrics for bag-making purposes are usually of plain weave, although a twill weave is sometimes demanded. Generally the smaller sizes of bags are made from cloth which has been bleached and finished, but the larger sizes are normally made from grey or unbleached cloth as given below.

3.2.1 *Bleached Cloth* — This cloth is bleached and finished and is normally a light weight plain weave material. It is used for making smaller bags to contain material, say up to 10 kg. It is also suitable for lining sacks, barrels, boxes, etc, where the strain is borne by the outer packages. Heavier weight bleached cloth is available for special purposes.

3.2.2 *Grey or Unbleached Cloth* — This cloth is in the loom state, that is, not bleached or finished, and may be plain weave or twill weave material. Generally, this fabric, due to the heavier yarns employed in its making, is used for making larger capacity bags up to about 100 kg.

4. MAN-MADE FABRICS

4.1 High density polyethylene (HDPE) fabric is the basic man-made fabric used for making bags and sacks for packaging. Sacks made from this material are generally used for packaging products such as fertilizers, powdered chemicals, foodgrains, plastic raw materials, sugar, etc. Earlier these materials were packed in gunny bags or modified versions of gunny bags such as laminated with kraft paper, polyethylene film, bitumen coating, etc. Presently, however, increasing use of sacks made of HDPE is being made which has the advantage of inertness, a quality of the ethylene polymer.

4.2 Terminology — The definitions and terminology relating to man-made fabrics are given in IS : 1324-1966*.

4.3 Materials — The HDPE fabric is woven on a loom from HDPE tapes (*see* IS : 6192-1971†). For the formation of sacks this is either woven as a tube and then cut to required size or as a flat material.

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*Glossary of textiles terms relating to man-made fibre and fabric industry (*first revision*).

†Monoaxially-oriented high-density polyethylene tapes.

4.3.1 The sack tube is produced on a circular loom or on a flat bed loom which effectively weaves two layers or fabric. The weft is passed via a shuttle through each layer in turn in such a way that it forms a tube in which the weft is continuous around the tube so formed. When this method is used the weft direction tape lies in the transverse direction of the finished sack. For further details of HDPE fabrics reference may be made to IS : 6340-1971*, and IS : 8069 (Parts 1 and 2)-1981†.

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*Specification for High density of polyethylene woven sacks.

†Specification for High density polyethylene (HDPE) for packing pesticides:
(Part 1)-1981 Woven sacks.
(Part 2)-1981 Woven bags.